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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,624	03/31/2004	Yuji Hamada	50024-036	3821

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EXAMINER
GARRETT, DAWN L

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
11/18/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/813,624	HAMADA ET AL.	
	Examiner	Art Unit	
	Dawn Garrett	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,19,20,22 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,19,20,22 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is in response to the reply filed July 24, 2009. No amendments were made. Claims 2, 4-18, 21, and 23 are cancelled. Claims 1, 3, 19, 20, 22, and 24 remain pending.

Claim Rejections - 35 USC § 102 and 103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 19, 20, 22, and 24 are again rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Qiu et al., Thin Solid Films, Vol. 372, (2000), pages 265-270.

Qiu et al. discloses EL devices comprising NPB hole transporting film (see page 267, second column, last sentence prior to section 4). The NPB compound was synthesized by an Ullmann reaction in the presence of copper and further purified (see page 266, first column, Section 2: "Experimental"). Because Qiu et al. discloses the same method of making NPB compound as set forth by applicant in the instant disclosure, the compounds obtained are

considered to inherently have the same characteristics, including copper impurity levels, as set forth by applicant. See product-by-process discussion in MPEP 2113.

With regard to claims 19 and 24, regardless of a method of detecting impurities, the final product in the prior art is considered to meet all product limitations of the claims as required. The apparatus and method for detecting impurities do not effect the composition of the device product. In addition, ICP is a well known analytical method of elemental analysis as evidenced by Power et al. (US 5,756,786).

In the alternative that Qiu et al. does not *anticipate* the purity levels of the organic compounds of the claims, it would have been obvious to one of ordinary skill in the art at the time of the invention to have purified and to have selected an organic phenylamino compound of a desired purity as one would expect a purer form of a compound to perform a better hole transporting function than an impure form of the compound in a device. The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicant's claims patentable in the absence of unexpected results. Furthermore, it is obvious to purify a known compound (see MPEP 2144.04).

5. Claims 1, 3, 19, 20, 22, and 24 are again rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Higashi (EP 1063869 A1).

Higashi et al. discloses organic electroluminescent devices with an organic compound layer having an impurity concentration of lower than 1000 ppm (see abstract). This impurity concentration encompasses the impurity range required by the present claims. The organic compounds may include phenylamino-containing compounds (see par. 49, 75-77 and 88-95).

The electroluminescent devices include light emitting and carrier transporting layers per claim 3 (see par. 12). Higashi teaches N,N'-Di(naphthyl-1-yl)-N,N'-diphenyl-4,4'-benzidine as a hole transporting material (see par. 92, pages 34-35). Higashi further teaches the synthesis steps to make the benzidine compound uses copper powder (see par. 93). The compounds formed by the process would be expected to have a similar level of copper impurities as recited in the claims since the process used is similar to that described by applicant, because applicant does not recite or expressly disclose any specific process of achieving the claimed levels of purity beyond synthesis by an Ullmann reaction. Higashi further discusses impurities in paragraph 94, but the total impurities discussed include compounds in addition to residual copper powder.

With regard to claims 19 and 24, regardless of a method of detecting impurities, the final product in the prior art is considered to meet all product limitations of the claims as required. The apparatus and method for detecting impurities do not effect the composition of the device product. In addition, ICP is a well known analytical method of elemental analysis as evidenced by Power et al. (US 5,756,786).

In the alternative that Higashi et al. does not *anticipate* the purity levels of the organic compounds of the claims, it would have been obvious to one of ordinary skill in the art at the time of the invention to have purified and to have selected NPB compound of a desired purity as one would expect a purer form of a compound to perform a better hole transporting function than an impure form of the compound in a device. The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicant's claims patentable in the absence of unexpected results. Furthermore, it is obvious to purify a known compound (see MPEP 2144.04).

6. Claims 1, 3, 19, 20, 22, and 24 are again rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Matsuo et al. (EP 1231252 A2).

Matsuo et al. discloses EL devices comprising NPB hole transporting film (see page 3, par. 16 and 17). The electroluminescent devices include light emitting and carrier transporting layers per claim 3 (see Examples section). Ullmann reaction in the presence of copper and further purification is disclosed (see in particular par. 41-43, 70, and 75). Because Matsuo et al. disclose the same method of making NPB compound as set forth by applicant in the instant disclosure, the compounds obtained are considered to inherently have the same characteristics, including copper impurity levels, as set forth by applicant. See product-by-process discussion in MPEP 2113.

With regard to claims 19 and 24, regardless of a method of detecting impurities, the final product in the prior art is considered to meet all product limitations of the claims as required. The apparatus and method for detecting impurities do not effect the composition of the device product. In addition, ICP is a well known analytical method of elemental analysis as evidenced by Power et al. (US 5,756,786).

In the alternative that Matsuo et al. does not *anticipate* the purity levels of the organic compounds of the claims, it would have been obvious to one of ordinary skill in the art at the time of the invention to have purified and to have selected NPB compound of a desired purity as one would expect a purer form of a compound to perform a better hole transporting function than an impure form of the compound in a device. The experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicant's claims patentable in

the absence of unexpected results. Furthermore, it is obvious to purify a known compound (see MPEP 2144.04).

7. Claim 3 is again rejected under 35 U.S.C. 103(a) as being unpatentable over Qui et al., Thin Solid Films, Vol. 372, (2000), pages 265-270. The rejection of claim 1 over Qui et al. is relied upon as set forth above. Qui et al. do not specifically discuss a separate luminescent layer in their experimental EL device, but do teach the devices emit light and set forth references to conventional EL devices in footnotes 1-12, which have luminescent layers for producing light (see page 265). It would have been obvious to one of ordinary skill in the art to have included a luminescent layer in the EL devices taught by Qui et al. having a NPB hole transporting film, because one would expect to achieve light emission with a predictable result from the EL device.

Response to Arguments

8. Applicant's arguments filed July 24, 2009 have been fully considered but they are not persuasive.

The examiner maintains Qiu and Matsuo utilize the same method of synthesis for obtaining amine compounds. These compounds formed by the same method as applicant (an Ullmann reaction) are considered to have the same properties. Applicant has not clearly described a more specific method for obtaining the claimed range of copper impurity. Based upon applicant's disclosed information for obtaining the compounds, the examiner maintains the compounds made by the same method would have the same properties. Furthermore, applicant alleges unexpected results with respect to the claimed range of copper impurity. The examiner

maintains the results show an expected trend that performance of the amine compounds is improved as impurities are decreased. Ultimately, an amine compound with no impurity would be expected to provide optimal performance. Applicant has not shown a criticality of the presence of the specifically claimed range of copper impurity with the amine compound in operating a device. The copper impurity does not provide a beneficial contribution to the functional operation of the device. A device comprising amine compound without impurities or the fewest possible impurities would be expected to provide optimal performance. It is known in the art of organic compound synthesis and EL devices that compounds free of impurities are desired and provide devices with a longer operational lifetime. For this reason, there are many processes for purifying organic compounds (such as an ICP method) taught in prior art. It is obvious to utilize compounds having limited impurities, because the purified functional compounds work better than compounds having their functionality compromised by the presence of impurities.

Regarding the optimization of copper impurities in the amine compounds, the examiner maintains it is obvious to reduce copper impurity levels to a low level, because more pure compounds perform better by not having their functionality compromised as compared to more impure compounds. The performance of a compound and the degree of impurity in the compound is relative. As impurities increase performance is decreased.

The rejections are respectfully maintained.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dawn Garrett/
Primary Examiner, Art Unit 1794

November 12, 2009